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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,297	03/25/2004	Kiyoshi Chikamatsu	40020852-02	1500

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EXAMINER

WEST, JEFFREY R

ART UNIT	PAPER NUMBER
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2857

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/809,297	CHIKAMATSU, KIYOSHI	
	Examiner	Art Unit	
	Jeffrey R. West	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,6,8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 23, 2006, has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 5 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 5 and 10 are rejected as failing to comply with the written description requirement because they recite, "wherein a ratio of the frequency of said pre-determined frequency signal and said signal under test is an integer of 2 or higher,

and wherein a ratio of the frequency of a local signal inputted into said frequency converter and said signal under test is an integer of 3 or higher”.

Turning to the specification, the closest support can be found in the following passages:

Moreover, the present invention is an impedance measuring apparatus comprising a vector-detecting apparatus, with this vector-detecting apparatus comprising a first filter and a second filter whose impulse responses are orthogonal to each other and the output of the first filter serving as the in-phase component of the pre-determined frequency signal and the output of the second filter serving as the quadrature-phase component of the pre-determined frequency signal. Moreover, when the input signal is frequency-converted at the step before the vector-detecting apparatus, the ratio of the frequency before this conversion and the frequency after this conversion becomes an integer of 2 or higher. (page 8, lines 11-20)

Vector ratio-determining device 700 is a device that determines the vector ratio between voltage signal E_{dut} and voltage signal E_{rr} . Vector ratio-determining device 700 comprises as its structural elements buffer amps 710, 720, and 740, a switch 730, a vector-detecting apparatus 800, and a CPU 750. (page 11, lines 1-4)

Finally, CPU 750 measures the vector ratio of voltage signal E_{dut} and voltage signal E_{rr} from the respective in-phase component and the quadrature-phase component. (page 18, lines 4-6)

Moreover, when a frequency converter is set up in the vector-detecting apparatus, the ratio of the frequency before conversion by the frequency converter and the frequency after conversion is an integer of 2 or higher and the output signals of the frequency converter are input to the first filtration means and the second filtration means. Therefore, the band of the low-pass filter that is in back of the frequency converter can be expanded and as a result, high-precision, high-speed vector detection of the measurement signals can be realized. (page 25, lines 4-10)

As can be seen above, the specification only supports the requirement of a single ratio between the frequency before conversion and the frequency after conversion as an integer of 2 or higher and does not provide any support for the requirement of a second ratio between a local signal and the signal under test as an integer of 3 or

higher. For this reason, claims 5 and 10 are rejected as failing to comply with the written description requirement.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3, and 5, as may best be understood, are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,808,463 to Nagano.

With respect to claims 1 and 3, Nagano discloses a vector-detecting apparatus that detects the in-phase component and the quadrature-phase component of a pre-determined frequency signal, said apparatus comprising a frequency converter for converting said pre-determined frequency signal to a signal under test (column 5, lines 6-12), a first digital filter, and a second digital filter (column 6, line 34), wherein said first and second filters filter the output signal of said frequency converter and whose impulse responses are orthogonal to each other (column 5, lines 30-34), and wherein the output of said first filter is regarded as the in-phase component of said signal under test, and the output of said second filter is regarded as the quadrature-phase component of said signal under test (column 5, lines 34-38) and wherein said first filter and said second filter are digital filters (column 5, lines 33-35).

Nagano also discloses that the response of said first filter is weighted by the sine function of the same frequency as said signal under test after frequency conversion by said frequency converter, and the impulse response of said second filter is weighted by the cosine function of the same frequency of the same signal under test after frequency conversion by the frequency converter (column 5, lines 53-64).

Nagano further discloses that the ratio of the frequency of said pre-determined frequency signal and said signal under test is an integer of 3 or higher (column 5, lines 22-29 and column 8, lines 17-32) and, since the frequency of the pre-determined frequency signal depends on the frequency of a local signal inputted into the frequency converter, Nagano further discloses that a ratio of the frequency of a local signal inputted into said frequency converter and said signal under test is also an integer of 3 or higher (Figure 3, column 5, lines 22-29 and column 8, lines 17-32).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 6, 8, and 10, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano in view of U.S. Patent No. 4,888,701 to Wakasugi et al.

As noted above, the invention of Nagano teaches all of the features of the claimed invention except for explicitly stating that the apparatus of Nagano is used as part of an impedance measuring apparatus.

Wakasugi teaches an apparatus for measuring a vector voltage ratio including a plurality of phase detectors connected to a plurality of A/D converters (column 3, lines 2-6) for detecting in-phase and quadrature-phase vectors (i.e. vectors with phase components 90 degrees from each other) (column 3, lines 29-37) for use in measuring impedance (column 4, lines 16-30).

It would have been obvious to one having ordinary skill in the art to modify the invention of Nagano to explicitly state that the apparatus of Nagano is used as part of an impedance measuring apparatus because the invention of Wakasugi suggests that impedance measuring apparatuses require accurate measurements of in-phase and quadrature-components (column 1, lines 6-25) and therefore the combination would have provided a wider variety of applications of the invention of Nagano by applying the in-phase and quadrature phase detection means to an impedance measuring apparatus.

Further, the limitation specifying the use of the apparatus of Nagano as part of an impedance measuring apparatus is considered to be a recitation of intended use. It has been held that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In this

case, since the structure of Nagano could be used in any of a plurality of apparatuses, including an impedance measuring apparatus, it meets the claim.

Further still, Applicant admits as Prior Art in the Background of the Invention that it is well-known in the art to use in-phase and quadrature detection in impedance measuring devices. Therefore, it would have been obvious to one having ordinary skill in the art to conform to what is common in the art by applying the method of Nagano to a conventional impedance measuring apparatus. *When applicant states that something is prior art, it is taken as being available as prior art against the claims. Admitted prior art can be used in obviousness rejections. In re Nomiya, 509 F.2d 566, 184 USPQ 607, 610 (CCPA 1975).*

Response to Arguments

8. Applicant's arguments with respect to claims 1, 3, 5, 6, 8, and 10 have been considered but are moot in view of the new ground(s) of rejection.

The following arguments are also noted:

Applicant first argues:

Nagano discloses extraction of the in-phase and quadrature components of a signal. Nagano merely discloses two filters, a first of which receives an in-phase component and a second of which receives a quadrature component. However, Nagano does not disclose filters having a fixed impulse response relative to one another. Indeed, the impulse responses of the filters are not specified in Nagano. As is known in the art, each filter in Nagano can filter each input signal without the necessity of an orthogonal relationship between each filter's impulse response. Therefore, **Nagano does not disclose or suggest two filters having impulse responses that are orthogonal to one another.** Therefore, Nagano does not disclose or suggest "a first filter; and a second filter whose impulse response is orthogonal to said first filter," as recited in claim 1.

The Examiner maintains that since the invention of Nagano specifically discloses that the inputs of the first and second filters are multiplied by cosine and sine functions that form orthogonal in-phase and quadrature components, the input responses of the first and second filters are similarly orthogonal to each other.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent Application Publication No. 2004/0070766 to Szafraniec teaches a method and apparatus for a Jones Vector based heterodyne optical polarimeter including the use of two orthogonal filters to determined in-phase and quadrature components.

U.S. Patent No. 6,724,832 to Hershberger teaches a vestigial sideband generator including two low-pass filters for producing folded orthogonal base-band components of I (i.e. in-phase) and Q (i.e. quadrature).

U.S. Patent No. 6,704,324 to Holmquist teaches an apparatus and method for transmission of voice band signals over a DSL line including determining in-phase and quadrature components in accordance with orthogonal Hilbert pass-band filters.

10. Any inquiry concerning this communication or earlier communications from the

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examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Jeffrey R. West', with a stylized flourish at the end.

Jeffrey R. West
Examiner – AU 2857

August 7, 2006